In the Claims

1. (Currently Amended) A photon counting (PC) radiographic system comprising:

a radiographic energy detector configured to detect radiographic energy passing through an object to be imaged and having a given flux rate and output electrical signals indicative of the detected radiographic energy;

a PC channel connected to receive the electrical signals and sample the electrical signals in a sampling window and provide a photon count output; and

a control operationally connected to the PC channel and configured to automatically adjust the sampling window at least as a function of the given flux rate.

2. (Original) The system of claim 1 wherein the control is further configured to decrease the sampling window with an increase in the given flux rate.

3. (Original) The system of claim 1 wherein the control is further configured to increase the sampling window with a decrease in the given flux rate.

4. (Original) The system of claim 1 further comprising a feedback loop between the photon count output and the control, and wherein the control is further configured to determine the given flux rate based on photon count data received across the feedback loop.

5. (Original) The system of claim 1 wherein the control is further configured to adjust an energy level threshold based on an adjustment of the sampling window to accept photons with acceptable energy levels.

6. (Original) The system of claim 1 wherein the radiographic energy detector is configured to detect radiation energy with a wavelength less than 10 nanometers.

7. (Original) The system of claim 6 wherein the radiation energy detector is configured to detect x-ray energy.

8. (Currently Amended) A CT system comprising:

a rotatable gantry having a bore centrally disposed therein;

a table movable fore and aft through the bore and configured to position a subject <u>to be imaged</u> for CT data acquisition;

a radiographic energy projection source positioned within the rotatable gantry and configured to project radiographic energy toward the subject; and

a detector assembly disposed within the rotatable gantry and configured to detect radiographic energy projected by the projection source and impinged by the subject, the detector assembly including:

a detector element configured to output electrical signals indicative of detected radiographic energy <u>attenuated by the subject</u>;

a PC channel operationally connected to the detector element and configured to count a number of photons of the detected radiographic energy according to a variable shaping time; and

a shaping time controller operationally connected to the PC channel and configured to control the variable shaping time in near real-time based on the photon output count data.

9. (Original) The CT system of claim 8 wherein the radiographic energy includes x-ray energy, and wherein the table is designed to position a medical patient within the bore.

10. (Original) The CT system of claim 8 wherein the shaping time controller is further configured to shorten the variable shaping time as the number of photons counted increases.

11. (Original) The CT system of claim 8 wherein the shaping time controller is further configured to lengthen the variable shaping time as the number of photons counted decreases.

12. (Original) The CT system of claim 8 wherein the number of photons counted is a function of flux of the radiographic energy received by the detector element.

13. (Original) The CT system of claim 8 wherein the shaping time controller is further configured to control the variable shaping time to prevent saturation of the PC channel.

14. (Original) The CT system of claim 13 wherein the variable shaping time defines a balance between charge integration time and channel recovery time.

15. (Original) The CT system of claim 8 wherein the PC channel includes:

a low-noise, high-speed charge amplifier;

a signal shaper operationally connected to the low-noise, high-speed charge amplifier designed to extract individual photon events;

an energy level discriminator operationally connected to the signal shaper and designed to identify a photon energy for each photon event; and

a photon counting element operationally connected to the energy level discriminator and designed to count the number of photons for a number of photon identified energies.

16. (Original) The CT system of claim 8 further comprising an energy level controller operationally connected to the shaping time controller and designed to accept photon events for counting having acceptable energy levels.

17. (Original) The CT system of claim 16 wherein the energy level controller is further designed to assure linear energy response independent of the variable shaping time and/or the number of photons counted.

18. (Currently Amended) A method of preventing radiation energy detector saturation comprising the steps of:

monitoring flux of radiation energy <u>that has passed through an object to be imaged, the radiation energy</u> having a number of photons received by a photon counting, radiation energy detector, the detector designed to sample a photon charge cloud within a given sampling window and count the number of photons;

comparing a current flux on the radiation energy detector to a base flux level corresponding to the given sampling window; and

adjusting the given sampling window to correspond to the current flux based on the comparison.

19. (Original) The method of claim 18 wherein the step of adjusting includes the step of lengthening the given sampling window if a level of the current flux is less than the base flux.

20. (Original) The method of claim 18 wherein the step of adjusting includes the step of shortening the given sampling window if a level of the current flux is more than the base flux.

21. (Original) The method of claim 18 wherein the step of monitoring includes the step of receiving an indication of the number of photons counted by the radiation detector.

22. (Original) The method of claim 18 further comprising the step of automatically adjusting an energy level threshold in response to an adjustment of the given sampling window.

23. (Original) The method of claim 18 further comprising the step of data processing and reconstructing an image of a subject and wherein the image includes tissue differentiation.